



TESTIMONY OF ALEX MATTHIESSEN

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U.S. Congressional Subcommittee Hearing on *Emerging
Threats: Assessing Public Safety and Security Measures at
Nuclear Power Facilities*

Rep. Christopher Shays, Connecticut
Subcommittee Chairman

Subcommittee on National Security, Emerging Threats, and
International Relations of the Government Reform Committee

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Subcommittee Chairman Christopher H. Shays and members of the subcommittee:

Thank you for the opportunity to once again provide testimony on this crucial public health and safety issue affecting millions of people living and working in the populated region surrounding the Indian Point nuclear power plant.

I am Alex Matthiessen, executive director for Riverkeeper, Inc, an independent, member-supported, not-for-profit organization whose mission is to protect the Hudson River and to safeguard the New York City drinking water supply that serves over 9 million New Yorkers. Since its founding in 1966, Riverkeeper has led the battle to restore the Hudson River and has successfully prosecuted hundreds of environmental law breakers. Riverkeeper and its predecessor, the Hudson River Fishermen's Association, Inc., has nearly 40 years of experience with Hudson River issues, and is a leader in the pursuit of economically viable and ecologically sound power plants.

Riverkeeper is not and has never been an anti-nuclear organization. Our focus is solely on the Indian Point nuclear power plant and the federal policies that affect Indian Point and the communities surrounding the facility.

I. BACKGROUND

A. Unique Characteristics

The Indian Point nuclear power plant, located in Buchanan, NY, on the Hudson River, 35 miles north of Times Square in New York City, is situated in the midst of the densest population surrounding any U.S. commercial reactor site in the country. Over 300,000 people live within a 10-mile radius of Indian Point and nearly twenty million people live within a 50-mile radius.

Indian Point is in close proximity to the nation's financial and media center and transportation hub. It looms over the nation's largest regional metropolitan economy, which is home to numerous Fortune 500 companies.

Indian Point is just miles from the Croton, West Branch and Kensico reservoirs which provide drinking water for 9 million Westchester County and New York City residents.

These are just a few of the reasons why our organization, along with 70 others, has argued that Indian Point is a unique case that deserves special attention from the federal government. Given al Qaeda's apparent fixation on New York and the group's stated aim of using a future attack to maximize economic and psychological damage and loss of life, Indian Point is arguably one of the most attractive terrorist targets in the country.

In 1979, in the wake of the Three Mile Island meltdown, NRC's Director of the Office of State Programs, Robert Ryan stated that:

“...it is insane to have a three-unit reactor on the Hudson River in Westchester County, 40 miles from Time Square, 20 miles from the Bronx. And if you

describe that 50-mile circle, as I said before, you've got 21 million people. And that's crazy. I'm sorry. I just don't think that that's the right place to put a nuclear facility."

If, decades ago, doubt existed regarding Indian Point's location, then post September 11th we really need to question the wisdom of allowing Indian Point to continue operating in close proximity to such a densely populated area. Clearly, today, we would not site Indian Point this close to the New York City metropolitan area.

Prompted by concerns regarding security, emergency preparedness and safety, over 400 elected officials at the local, state, and federal level are calling for Indian Point's shutdown. At the local level, over 50 municipalities have passed resolutions calling for an end to the plant's operation.

B. 9/11 Commission Report Reveals That the Threat to Indian Point is Real

The 9/11 Commission Report, released in late July, revealed that Mohamed Atta, the plot's ringleader, who piloted one of the planes that hit the World Trade Center, "considered targeting a nuclear facility he had seen during familiarization flights near New York."

While the nuclear plant was not identified in the report, several strong pieces of evidence suggest Indian Point. First, the terrorists had rented planes from Teterboro Airport – in northern New Jersey about 30 miles from Indian Point – for their reconnaissance flights. Second, the terrorists' test flights included trips along the Hudson River corridor which the terrorists used as a guide on their way to the World Trade Towers on 9/11. Third, Indian Point is the only nuclear power plant in the Hudson corridor. Among other area nuclear plants, Indian Point is the closest to New York City.

A June 16, 2004 9/11 Commission Staff statement reinforces earlier reports that the original plot for September 11th was to involve attacks on nuclear power plants. According to the statement: "K.S.M. [Khalid Sheikh Mohammed] maintains that his initial proposal involved hijacking 10 planes to attack targets on both the East and West Coasts of the United States...[including] C.I.A. and F.B.I. headquarters, unidentified nuclear power plants and the tallest buildings in California and Washington State." [emphasis added]

In startling testimony before the 9/11 commission on June 16, two CIA officials claimed the agency has thwarted several al-Qaeda attacks since Sept. 11, 2001, and one said, "*I think we've probably prevented a few aviation attacks against both the East and West coasts.*" A nuclear power plant, possibly Indian Point, could have been a target of these thwarted attacks.

If Indian Point was among the "unidentified nuclear power plants" targeted in the original plot, then our federal government must assume that terrorists may attack Indian Point in the future. Let's not forget that before the terrorists brought down the World Trade Towers on September 11, 2001 the WTC site had been targeted before – back in February 1993.

C. Gaps and Weaknesses in Emergency Preparedness and Security

Emergency Planning

Since the attacks of September 11th, legitimate concerns have been brought up by members of the public and elected officials regarding the inability of the emergency preparedness plan to protect the public in the event of a radioactive release from Indian Point. Valid concerns have also been raised about security lapses and poor security defenses at Indian Point. These issues are closely entwined.

Concerns about deficiencies within the plant's emergency plan were validated by the March 2003 release of the final report by James Lee Witt Associates on the adequacy of Indian Point's emergency plan. The report's conclusions are decisive, irrefutable and inescapable. With regard to the "problems" associated with the emergency plan, Witt Associates states that,

“...it is our conclusion that the current radiological response system and capabilities are not adequate to overcome their combined weight and protect the people from an unacceptable dose of radiation in the event of a release from Indian Point.”

The Witt report, commissioned by New York State Governor Pataki, went on to say that “this is especially true if the release is faster or larger than the typical exercise scenario.” This is a key point given the fact that the latest biennial emergency exercise conducted for Indian Point back in early June did not involve a fast breaking release of radiation. In fact, it failed to incorporate a simulated release of radiation altogether!

The June exercise spearheaded by DHS, FEMA and the NRC was highly orchestrated and geared mostly towards public relations than public safety. While June 8, 2004 will go into the history books as the first time federal agencies held a radiological emergency exercise for a nuclear power plant featuring a mock terrorist scenario, it will be remembered for exhibiting our federal government at its very worst.

At the heart of the exercise scenario, a hijacked 767 commercial airplane crashed into a parking lot and careened into a transformer on the Indian Point site. With the transformer knocked out, and the subsequent loss of offsite power, a chain of events unfolded that culminated with the threat of a reactor core meltdown. The scenario evolved over a ten hour period and resulted in no releases. This left many scratching their heads since last summer the NRC and FEMA told the press that the next exercise would involve a fast-breaking release of radiation.

Most troubling were statements made to the press by NRC officials which were clearly designed to imply that the 767 crashed into a containment dome but failed to penetrate and cause a release. In one instance Brian Holian, deputy director of reactor projects for NRC Region I, was quoted in the press as saying “[the] scenario of the crash included no damage to the reactor's concrete containment building” and then in the same breath stated that recent studies showed “most plane crashes into containment buildings would not result in significant releases of radiation.”

Holian's comments are an obvious ploy indicative of a broader public relations effort on the part of the Department of Homeland Security, FEMA, NRC and Entergy designed to convince the public that Indian Point is not vulnerable to a terrorist attack.

In fact, determined terrorists targeting Indian Point could succeed in breaching a reactor containment dome and damaging the reactor core, resulting in a subsequent release of radiation. A successful terrorist strike on one of the spent fuel pools could result in a pool fire and major radioactive release.

What remains so disturbing is how these agencies have been able to certify Indian Point's unworkable emergency plan while providing so little evidence that the plan would actually protect the public.

Plant Security

On the matter of security, Indian Point continues to lack appropriate defense systems to repel an attack from the air, land and water. The spent fuel pools, cooling intakes, steam lines, control room buildings, transmission lines and back-up diesel generators remain vulnerable targets. In section III we present recommendations for boosting security at the plant in a manner that will better protect these vulnerable targets.

It is also important to note that security officers at Indian Point continue to raise concerns about poor training and weak testing. Last September, the Project on Government Oversight (POGO) criticized the NRC for making the July 2003 force-on-force security exercise at Indian Point too easy. POGO's criticisms were based on information gathered from participants and observers of the test. Among the major problems identified:

- The number of attackers in the test was "barely above the much-ridiculed" three attackers required under pre-9/11 security rules, POGO pointed out that "the intelligence community generally believes that terrorists would attack a target with a squad-sized force, which in the Army is 12 and the Navy is 14";
- The attack simulation did not incorporate the possible use by terrorists of commonly available weaponry including .50 caliber rifles with armor-piercing incendiary rounds, or rocket-propelled grenades;
- All three force-on-force tests took place in broad daylight although intelligence experts agree that an attack would likely take place in the dark. In two drills "mock terrorists crossed open fields in broad daylight in order to reach the protected area, making it that much easier for them to be observed by the security officers"; and
- Mock terrorists were security officers from another plant who had no training in terrorist tactics.

NRC officials claim the role of security officers is to hold off attackers until outside responders arrive. However, as POGO correctly notes, tests have shown that an attack is generally won or

lost in between three and eight minutes, and SWAT response times are proven to be between one and two hours.

Also disturbing is that documents leaked to POGO in the spring of 2003 revealed that Indian Point's owner crammed for the July test. POGO's investigations found that with months of advance notice from the NRC, nuclear plants often game the testing system, hiring security consultants and additional guards in the months leading up to the force-on-force tests. Once the tests are completed, security consultants are let go and the guard force reduced until the next test. The July 2003 exercise for Indian Point exemplifies POGO's findings.

Many of these issues were also discussed in an internal January 2002 Entergy report that was leaked to Riverkeeper in December 2002. The January 2002 report, which was best known for documenting that only 19 percent of the guard force believed they could successfully defend the plant against a terrorist attack, infuriated local, state, and federal officials because it directly contradicted past proclamations – issued by Entergy, the U.S. Nuclear Regulatory Commission, and the State Office of Public Security – that Indian Point is secure. One can only wonder what Mr. Kallstrom was thinking about on Dec. 13, 2001 when he declared Indian Point to be the best defended facility in the nation and brazenly taunted terrorists to attempt an assault on the plant. His statement, troubling then, is more disturbing now given that very the next month a security consultant for Entergy delivered his report.

D. Catastrophic Consequences

The bottom line for this public health and safety issue is that the risks associated with Indian Point far outweigh the benefits. There is no question that the risks are significant and the consequences catastrophic.

A new study released by Riverkeeper on September 8 found that the potential health consequences of a successful terrorist attack on the Indian Point nuclear plant could exceed 500,000 long-term cancer fatalities and reach 44,000 early fatalities under worst-case conditions. Dr. Edwin Lyman, a senior staff scientist in the Global Security Program at the Union of Concerned Scientists, authored the report titled “Chernobyl-on-the-Hudson?: The Health and Economic Impacts of a Terrorist Attack at the Indian Point Nuclear Plant.”

The study uses the NRC's current computer models and methodology to update a 1982 congressional report based on Sandia National Laboratories' CRAC-2 (Calculation of Reactor Accident Consequences) study. CRAC-2 found that a core meltdown and consequent radiological release at one of the two operating Indian Point reactors could cause 50,000 early fatalities from acute radiation syndrome and 14,000 latent fatalities from cancer.

Given a successful attack at one of the two operating Indian Point reactors, the report finds that:

- The number of near-term deaths within 50 miles, due to lethal radiation exposures received within 7 days after the attack, is approximately 3,500 for 95th percentile weather conditions, and approximately 44,000 for the worst case evaluated. Although the report assumed that the 10-mile emergency planning zone was entirely evacuated in these cases,

this effort was inadequate because (according to Entergy's own estimate) it would take nearly 9.5 hours to fully evacuate the 10-mile zone, whereas in the report's model the first radiological release occurs about two hours after the attack.

- Near-term deaths can occur among individuals living as far as 18 miles from Indian Point for the 95th percentile case, and as far as 60 miles away in the worst case evaluated. Timely sheltering could be effective in reducing the number of near-term deaths among people residing outside of the 10-mile emergency planning zone, but currently no formal emergency plan is required for these individuals.
- The number of long-term cancer deaths within 50 miles, due to non-acutely lethal radiation exposures within 7 days after the attack, is almost 100,000 for 95th percentile weather conditions and more than 500,000 for the worst weather case evaluated. The peak value corresponds to an attack timed to coincide with weather conditions that maximize radioactive fallout over New York City.
- Based on the 95th percentile case, Food and Drug Administration guidance would recommend that many New York City residents under 40, and children in particular, take potassium iodide (KI) to block absorption for radioactive iodine in the thyroid. However, there is no requirement that KI be stockpiled for use in New York City.
- The economic damages within 100 miles would exceed \$1.1 trillion for the 95th percentile case, and could be as great as \$2.1 trillion for the worst case evaluated, based on Environmental Protection Agency guidance for population relocation and cleanup.

The report's executive summary is included as Attachment A to this testimony. The full report is available at www.riverkeeper.org.

Finally, as we presented in our written testimony to this subcommittee in March 2002, the NRC's own documents reveal that the consequences of a large release could be severe. We touched upon several of these documents in testimony we provided in March of last year to this subcommittee.

II. THE FEDERAL GOVERNMENT'S APPROACH TO NUCLEAR SECURITY AND EMERGENCY PREPAREDNESS

For the federal agencies that regulate the nuclear power industry, corporate profits continue to be placed above public safety. The NRC and FEMA/DHS clearly have fallen captive to the industry they regulate. In addition, a bureaucratic paralysis or head-in-the-sand mindset appears to be plaguing the NRC and FEMA/DHS. These agencies seem unwilling to accept the new threat level and revamp regulations accordingly. As a result these agencies lack credibility with the American public which ultimately undermines their ability to effectively fulfill their responsibilities.

There are a number of major problems with the manner in which the federal government is currently handling security and emergency preparedness. Below, we touch upon just six of these.

A. NRC Refuses To Consider Terrorism In Administrative Proceedings

The NRC has ruled, in several recent administrative proceedings, that since terrorism is too speculative under the NEPA (National Environmental Policy Act) process, the issue of terrorism cannot be raised in site-specific proceedings such as license renewal. The NRC has argued that since the probability of terrorism cannot be estimated that it is not a matter that it needs to address within administrative proceedings. Ironically, the NRC consistently uses the threat of terrorism to justify their new policies that reduce the opportunities for public participation.

B. Design Basis Threat Level Is Set Too Low

The NRC has set its new post-9/11 Design Basis Threat (DBT) level too low. The DBT, which defines the size and capability of potential attackers that nuclear power plant owners must protect against, has been set at a level far short of the actual threat level we face today, even after the NRC's recent DBT upgrade. Force-on-force exercises likewise ought to be based on defending against a much a larger threat than the current DBT.

Another issue pertaining to the DBT relates to the federal government's role in protecting nuclear power plants against any threat above the DBT. Since plant operators are not required to defend against the threat above the DBT, is the federal government prepared to? Past news coverage has revealed that there is confusion among the federal agencies as to who is responsible for what and which agency would take authority in event of an attack on a nuclear power plant. Furthermore, while plant operators are tested in accordance with the DBT it remains unclear whether the federal government, for example the Department of Defense, is tested for its ability to prevent an attack that is above and beyond the DBT threshold.

C. Force-On-Force Exercises Are Highly Staged

The NRC's July 2003 force-on-force exercise at Indian Point lacked any element of surprise and as a result it failed to serve as evidence that the plant's security force could effectively repel an attack. This force-on-force exercise is explained in more detail earlier in the testimony.

D. Emergency Preparedness Regulations Are Inadequate

NRC and FEMA emergency preparedness regulations fail to take into consideration the unique conditions associated with a terrorist attack on a nuclear power plant and the implications for emergency response. The current emergency plan fails to address:

- A scenario involving a fast breaking release of radiation that results in significant contamination.

- A scenario in which the radioactive release contaminates a significant portion of the 10-mile emergency planning zone and parts of the 50-mile ingestion pathway zone and exposes citizens to higher-than-acceptable doses.
- A scenario involving major transportation arteries that are rendered impassable (either by acts of terrorism or gridlock) to people evacuating.
- A scenario in which a large number of people, who have been injured and contaminated and require treatment and decontamination.

E. Plant Licenses Are Not Required To Defend Against “Enemies of the U.S.”

NRC regulations¹ do not require nuclear plant licensees from having to protect their facilities from a military attack by a foreign power, but rather a sub-national terrorist group. The “enemy of the United States” provision, 10 CFR §50.13, exempts licensees, like Entergy, from providing “design features or other measures for ... protection against the effects of attacks and destructive acts, including sabotage, directed against the facility by an enemy of the United States, whether a foreign government or other person.” While the NRC licensees are responsible for protecting nuclear plants from sub-national groups, and the military is responsible for protecting them from attacks by the armed forces of enemies of the United States, the regulations are silent as to who is responsible for the range of threats in between these extremes. As a result, it is not immediately obvious where al Qaeda and other terrorist organizations fall in this classification.

The NRC has refused to consider implementing measures to protect nuclear plants from 9/11-type airborne assaults, claiming that it is the responsibility of the Federal government, and not nuclear plant owners, to protect against “enemies of the United States.” This gap in security leaves Indian Point dangerously vulnerable. Yet without an entity that has the authority to develop an adequate standard of protection for this plant, there is little hope that this security gap will be closed any time soon.

F. NRC Shrouded in Secrecy

The NRC continues to enact policies that allow it – and the nuclear industry it regulates – to operate in increasing secrecy and with reduced transparency and public participation. This will further undermine plant security and jeopardize public health and safety. Given the NRC’s track record of poor oversight, public scrutiny is needed more than ever.

Riverkeeper criticized the U.S. Nuclear Regulatory Commission’s August 4, 2004 declaration that the agency will no longer make available to the public the results of physical assessments of nuclear plant security or enforcement actions associated with such evaluations. Until now, the

¹ According to NRC regulations (10 CFR §73.55), NRC-licensed nuclear power plants must be provided with physical protection systems designed to protect against the design basis threat (DBT). The DBT is a description of the characteristics of an adversary force seeking to cause a radiological sabotage event (or theft or diversion of special nuclear materials from Category I fuel cycle facilities). Until recently, the DBT conformed to a set of very general, rather weak requirements (10 CFR §73.1), the majority of which were formulated in the late 1970s, based on what was believed to constitute a credible terrorist threat at the time. The DBT is meant to characterize the threat posed by a subnational terrorist group.

NRC has provided regular public updates on vulnerabilities and lapses that NRC inspectors have discovered at the country's 103 nuclear power reactors, such as weaknesses in training programs.

Lengthy discussions preceded the NRC's decision four years ago to put plant performance evaluations on the agency's Web site. Immediately after 9/11, the NRC pulled almost all information from its Web site and carefully vetted thousands of documents. The information was reviewed and, in many cases, put back on the site after being deemed acceptable for public consumption. The NRC's move to remove performance evaluations from their website, has left many asking "Why the sudden policy reversal?"

The NRC's policy change raises the question of whether the real intent is to shield plant owners from embarrassing security blunders becoming public. Last September, following the release of a report from the Government Accountability Office on nuclear plant security, the *New York Times* revealed that the NRC security assessment – which discovered a security officer asleep while on duty – occurred at Indian Point. NRC inspectors treated the Indian Point incident as a "non-cited violation because it did not affect plant security, according to a report issued by the commission that describes an inspection at the plant. The NRC's report also says the commission did not treat the incident more seriously because no guards had been found sleeping "more than twice during the past year." The GAO report noted that nationwide, the NRC tended not to issue formal citations and to minimize the significance of problems it found if the problems did not cause actual damage. In other words, since a terrorist attack did not take place while the security officer was asleep, the NRC refused to cite the plant's owner in violation of standards.

Ultimately, the NRC's new policy undermines security and makes Indian Point a more attractive terrorist target. Absent an explanation of what substantial security improvements have been made, one can only assume that little has been done to protect plants like Indian Point. The NRC is fooling no one – certainly not the people of New York and surely not the terrorists determined to strike again.

In addition, the NRC's new policy will further erode public confidence in the Commission's performance and calls into question whether the Commission is taking the appropriate actions to ensure that nuclear plants like Indian Point are not vulnerable to terrorist attack.

Security is a key component of the NRC's Reactor Oversight Process for Indian Point and other plants. Removing security from public scrutiny erodes much-needed transparency. Security concerns should be acknowledged and resolved, rather than shielded from the public. As a result, security gaffes will no longer be subject to the kind of public scrutiny that forces change.

III. RECOMMENDATIONS FOR IMPROVING SECURITY

The best way to truly minimize the public health and safety risks is to close the plant and secure the on-site spent fuel. **Section A** addresses the reduced risk associated with plant closure. Prior to the plant closing, and for a period after closure, strong security is crucial. **Section B** provides a series of recommendations for strengthening security at Indian Point.

A. Once Closed, Indian Point Becomes Less Of A Threat To Public Health And Safety

Closing Indian Point would have an immediate benefit. Just 20 days after shutdown, the radioactive inventory within the reactor containment buildings will decrease significantly through half-life decay. Consequent reductions in early fatalities within the 10-mile radius emergency planning zone would be 80%. Within the 50-mile radius ingestion pathway zone, there would be a 50% reduction in latent cancer fatalities. Given the high population density around the plant these percentages translate into tens of thousands of saved lives in the event of a catastrophic release triggered by accident or terrorist attack.

In addition, removing the fuel from the reactors – something that can be done approximately a week after shutdown – will allow security forces to focus their protection on the deadly irradiated fuel stored in the pools.

Moreover, a plant that is closed is no longer producing the irradiated fuel rods, which are most dangerous in the first six months upon removal from the reactor core.

It is easier to protect and monitor a reactor that is shut down. The site is most vulnerable while the reactor is operating. There are a number of ways to cause a meltdown of the reactor: cutting off-site power, destroying the cooling water intakes, sabotage/destruction of safety systems, destruction of the control room, as well as crashing a jet into the reactor building. The propensity of a reactor core to melt, if the flow of cooling water to the core is interrupted, is substantially reduced within just a few hours of shutdown.

B. Upgrading Indian Point's Security

1) Harden Spent Fuel Storage Systems: Indian Point's irradiated ("spent") fuel² stockpile must be better safeguarded. The current pool storage system and the proposed dry storage cask installation are grossly inadequate to protect public and worker health and safety. We propose instead the HOSS³ system, designed to contain and isolate radiation and repel terrorist attacks. HOSS can substantially diminish the risks associated with irradiated waste fuel storage by separating it into small batches, thereby eliminating the danger of one of the worst possible nuclear disasters – a fuel pool fire. HOSS is only intended as an interim measure until a suitable off-site national repository is designed. HOSS would involve the following:

- The irradiated fuel older than five years – which represents the vast majority of the fuel in the pools – should be placed in robust dry storage casks. Stored in hardened casks and dispersed and shielded appropriately, the irradiated fuel is less vulnerable to an irradiated fuel fire triggered by accident, sabotage or terrorist attack.

² A nuclear reactor core contains a number of fuel assemblies, bundles of thin tubes containing pellets of enriched uranium. These tubes are usually referred to as fuel rods. Over time, the buildup of neutron-absorbing poisons resulting from the chain reaction reduces the ability of the fuel to sustain an efficient chain reaction, and the rods must be replaced.

³ Concept conceived by Dr. Arjun Makhijani, President of the Institute for Energy and Environmental Research.

- The remaining irradiated fuel assemblies in the pool should be reconfigured so that the density is reduced and there is more space in between each assembly. The current spacing between fuel assemblies in the pool is dangerously close which increases the probability of an irradiated fuel fire. It also increases the likelihood that the fire would engulf more fuel and release greater amounts of radioactivity.
- Containment buildings, above-ground bunkers or berms should be used to shield the dry storage casks from line-of-sight so that the casks are not vulnerable to acts of terrorism involving hand-held weaponry (i.e. anti-tank missiles) or airplanes. If the current proposal is implemented, Entergy would ultimately have 53 casks situated together -- fully exposed -- on a concrete pad, and possibly many more casks if the NRC grants Entergy's request for a 20-year license renewal. With the casks stored in such a vulnerable manner, a terrorist attack involving a plane crash could destroy several casks and release radioactive material.⁴
- A robust, containment structure should be built over the existing irradiated fuel pools. The buildings that currently house each irradiated fuel pool at Indian Point do not serve as containment; nor are they fortified structures capable of repelling a terrorist attack.

While the U.S. drags its feet with respect to the need to better protect irradiated fuel, other nations have taken important steps to fortify irradiated fuel storage. One particular facility, the Gorleben nuclear fuel center in the German state of Lower Saxony, has a building which is licensed to hold 420 casks containing about 4200 tons of uranium in irradiated fuel. The walls and roof of the Gorleben building are about 50 and 15 cm thick reinforced concrete, respectively.⁵

2) Install Passive Defense Systems: Different types of passive defense systems can be deployed at nuclear power plants which would go a long way towards thwarting air-based attacks. Examples include:

- **Beamhenge:** Beamhenge⁶ should be installed at Indian Point in areas where postulated aerial attack impacts could result in damage to the reactor, spent fuel storage systems or other vulnerable targets like the steam lines running between the reactor and turbine buildings. Beamhenge is a line of steel beams set vertically in deep concrete foundations connected by bracing beams, a web of high-strength cables, wires, and netting linking the vertical beams to form a protective screen – the nuclear-grade equivalent of the fences erected around golf driving ranges.

⁴ Gordon Thompson, *Robust Storage of Spent Nuclear Fuel: A Neglected Issue of Homeland Security* by Institute for Resource and Security Studies. (January 2003)

⁵ Alvarez et al, "Reducing the Hazards from Stored Spent Power-Reactor Fuel in the United States," published in the journal *Science and Global Security*. (Spring 2003)

⁶ Source: The May/June issue of the Bulletin of the Atomic Scientists features an article on nuclear power plant security written by Dave Lochbaum, Ed Lyman and Daniel Hirsch. The article is titled "THE NRC's DIRTY LITTLE SECRET: The Nuclear Regulatory Commission is still unwilling to respond to serious security problems." See sidebar article by Joel Hirsch, titled "Beamhenge." The article can be viewed at:

<http://www.thebulletin.org/issues/2003/mj03/mj03hirsch.html#Anchor-Special-49575>

Beamhenge would not need to completely encircle the nuclear plant - it would merely need to shield the vulnerable side or sides of the facility's key structures. Depending on the nuclear plant's geography and vulnerabilities, Beamhenge could be a single row of closely spaced beams or multiple rows of more widely spaced beams. The height of the beams and the length of the Beamhenge would depend on the configuration of facilities being protected from likely incoming trajectories.

The main purpose of Beamhenge would be to slow down an attack, fragment the attacking aircraft into smaller pieces, disperse the mass of jet fuel, and protect the more vulnerable containment, spent fuel pool, and other structures located within the perimeter from being breached by the mass of the projectiles. The beams would tend to scatter the jet fuel and slow down other projectiles like the fuselage.

The structure would also provide some degree of protection against surface-to-surface and air-to-surface missiles, as well as other ballistic and self-propelled ordnance. The metal mesh netting strung between the vertical beams would not stop a projectile, but would serve to trigger detonation of its warhead before it reached the facility's walls.

- **Earth Berms:** Earth berms protect against attacks by rocket-propelled grenades, anti-tank missiles, aircraft attacks and many other possible scenarios. Berms can be used to protect various soft targets onsite including the dry casks that house spent fuel.
- **Dunlop Barriers:** Dunlop barriers should be installed in the Hudson River around Indian Point's exclusion zone to help protect such vulnerable targets as the cooling water intake structures. Dunlop barriers are inflated cylinders of a rubber-coated textile and are linked together or to a mooring buoy to form a security barrier around an exclusion zone. They can be used to thwart small-boat terrorist attacks. These barriers have already been put in place at several Navy bases.

3) Establish Combat Air Patrols and No Fly Zones: Until the passive defense systems are in place, a no fly zone should be imposed around the Indian Point nuclear power plant. Commercial and private aircraft should be prohibited from flying within 10 nautical miles or below 18,000 feet above 100 sensitive sites around the nation, including Indian Point. This would apply to commercial planes, private planes and helicopters.

No fly zones should be coupled with requiring the Department of Defense and the relevant departments to a) establish regular combat air patrols (CAP) over the Indian Point plant and b) conduct air intercept drills which include scenarios under which the potential target is Indian Point. These two measures were called for by Senator Hillary Clinton late last year.

News reports indicate that the FBI and the Department of Homeland Security have warned government and industry officials to be on guard against Al Qaeda operatives hijacking cargo jets in Canada, Mexico or the Caribbean and then flying them into this country to attack nuclear plants and other critical infrastructure.

By the government's admission, there remains no air defense for Indian Point other than "improved security at our nation's airports" (which still has a long way to go). There are no specific measures in place that would protect Indian Point from an aerial assault either by a jumbo jetliner or a small plane coming from one of the region's poorly secured airports. A no fly zone exists over Disney World and Disneyland but not over Indian Point. While hitting the containment domes with a commercial airliner could penetrate the domes and lead to a meltdown, a more vulnerable target would be the spent fuel pools.

4) Bolster Water-based Security: Coast Guard and naval militia presence on the water in front of the plant must be full-time. They must be armed with the appropriate technology and weaponry to thwart a water-based attack.

5) Augment Security Forces: The number of National Guard troops at Indian Point should be increased with a special focus on protecting the plant's more vulnerable targets such as the spent fuel storage systems.

6) Maintain Highest Alert Status for Indian Point: At all times, the Indian Point nuclear power plant should remain at the highest alert status.

7) Revamp Federal Policies and Regulations: Congress must revamp the NRC and FEMA's policies and regulations governing nuclear plant security and emergency preparedness. These agencies have stacked the deck against public interest groups and other parties who have tried to raise legitimate concerns regarding plant safety and security. The NRC's policies provide the most egregious example of government attempts to impede public participation. In several recent proceedings the NRC has argued that since terrorism is too speculative under the NEPA process, the issue of terrorism cannot be raised in site-specific proceedings such as license renewal.

Before making several recommendations, I'd like quickly address the issue of relicensing in more detail. It should go without saying that the license renewal issue raises several significant safety, security and environmental issues that affect not only the residents of the Hudson Valley, but impact the health and safety of those living and working in the greater New York City metropolitan area. The people of this region are all too familiar with the risks of global terrorism, and the potential twenty year extension of Indian Point's license must be considered in light of domestic security and emergency preparedness.

Furthermore, given the plant's aging condition and its close proximity to millions of residents, the extension request must be subjected to a heightened level of scrutiny. Given the significant increase in the local and regional population, as well as the heightened threat environment, the relicensing process must ask the basic question of whether this plant should continue to operate. Today, there are still too many questions and concerns about the security of the facility, its vulnerability to terrorist attack, its emergency response capability, as well as its underlying operation condition.

Specifically, we seek congressional support in challenging the manner in which the NRC handles the issue of terrorism and its relevance to NEPA.

We urge your leadership in Congress to ensure the passage of legislation that:

- a) Requires that a NEPA analysis specify that licensing requests need to be evaluated for environmental impacts associated with acts of terrorism on a nuclear power facility.
- b) Requires the NRC process license renewal requests as if they were new reactor proposals. This would ensure that antiquated studies, such as that regarding the seismic hazard threat to a plant, are not used as the basis for justifying an additional 20 years of operation. For the sake of argument, if Entergy chose to immediately close Indian Point's existing reactors and seek to replace them with new reactors, the new reactors would clearly have to meet the NRC's new and more stringent seismic criteria (10 CFR Part 100.23 deals with geologic and seismic siting criteria). The same stringent criteria pertaining to new reactors should also apply to existing reactors, like those at Indian Point, that are seeking a 20-year license renewal. It is unclear whether such stringent criteria are being applied to Indian Point.
- c) Requires the NRC, during its review of an applicant's request for license renewal, to examine the adequacy of the radiological emergency plan especially in cases as unique as Indian Point's and to publicize the criteria it employs to determine whether an emergency plan is adequate to protect public health and safety..
- d) Requires the NRC's current DBT to be upgraded in order to ensure that plant security will be able to thwart an assault by a substantial number of terrorists. For decades, many experts have advocated for a significantly upgraded DBT which would require protection against 20 outside attackers working in conjunction with one active insider. Today that recommendation seems logical since there were 19 terrorists involved in the highly coordinated, technologically advanced September 11 attacks. Indian Point should be required to defend and capable of defending against a highly coordinated, technologically advanced attack involving 20 suicidal attackers entering the site from multiple directions and working with one inside conspirator.
- e) Given the increased terrorist threat level, Indian Point's poor record on security, and the NRC's weak oversight, now is the time for greater scrutiny, not less. The NRC should reconsider its new policy on shielding security evaluations from the public. The NRC should implement an alternative policy that will allow nuclear watchdogs and public interest groups to participate in the development of security regulations and provide oversight in a manner that enhances security. Among the actions the NRC can take:
 - i) Re-institute the pre-09/11 practice of publicly reporting high-level results from NRC security inspections at nuclear plant sites. Such results include the proper protection of specific information about exploitable weaknesses.
 - ii) Re-institute the practice of routine public meetings on security policy issues.
- f) The Department of Homeland Security (DHS) should be granted the authority to issue legally binding orders to the NRC, among other agencies, and the ability to enforce them through inspections and punitive actions. Currently, DHS lacks this authority and the agencies'

“infrastructure protection” function has been relegated to an advisory role that the NRC is free to ignore. Failing to provide DHS with this authority was not an inadvertent omission.

IV. CONCLUSION

Little has changed since 9/11 regarding the level of security at Indian Point. In general, nuclear plant security only has been improved at the margins. Much of the upgrades to plant security are simply window dressing to give the illusion that security concerns are being taken seriously. Security officers inform us that in many cases, the problems have actually worsened at Indian Point.

Federal agencies remain in a state of denial and it is becoming increasingly apparent that the root of this denial is their bias toward protecting industry profits at the price of public safety.

At the very least, there are a number of obvious measures that the NRC should be able to support that would not present an economic burden to plant operators. It is not clear why the NRC has not called for such improvements, but one possibility is that the industry doesn’t want more visible security measures to raise questions among the public about the intrinsic safety of nuclear power, especially not at a time when the industry is hoping to build a whole new generation of plants.

The federal government’s current approach to nuclear plant security and emergency preparedness is leading us down a path that will result in far worse consequences than the tragedy of September 11th. We have received the warning signs regarding the possibility of and our vulnerability to a terrorist attack on a U.S. nuclear power plant, much as the government had received warnings about the 9/11 attacks. Let’s not give a future 9/11-type commission the opportunity to say we knew an attack on a nuclear plant was possible and did too little to stop it or minimize the impacts.

Thank you for the opportunity to participate in this hearing.

ATTACHMENT A

EXECUTIVE SUMMARY

(from the report “Chernobyl-on-the-Hudson?: The Health and Economic Impacts of a Terrorist Attack at the Indian Point Nuclear Plant.”)

Since 9/11, the specter of a terrorist attack at the Indian Point nuclear power plant, thirty-five miles upwind from midtown Manhattan, has caused great concern for residents of the New York metropolitan area. Although the Nuclear Regulatory Commission (NRC) ordered modest security upgrades at Indian Point and other nuclear power plants in response to the 9/11 attacks, the plants remain vulnerable, both to air attacks and to ground assaults by large terrorist teams with paramilitary training and advanced weaponry. Many question whether the NRC’s security and emergency planning requirements at Indian Point are adequate, given its attractiveness as a terrorist target and the grave consequences for the region of a successful attack.

This report presents the results of an independent analysis of the health and economic impacts of a terrorist attack at Indian Point that results in a core meltdown and a large radiological release to the environment. We find that, depending on the weather conditions, an attack could result in as many as 44,000 near-term deaths from acute radiation syndrome or as many as 518,000 long-term deaths from cancer among individuals within fifty miles of the plant. These findings confirm that Indian Point poses a severe threat to the entire metropolitan area. The scope of emergency planning measures should be promptly expanded to provide some protection from the fallout from an attack at Indian Point to those New York area residents who currently have none. Security at Indian Point should also be upgraded to a level commensurate with the threat it poses.

A 1982 study by Sandia National Laboratories found that a core meltdown and radiological release at one of the two operating Indian Point reactors could cause 50,000 near-term deaths from acute radiation syndrome and 14,000 long-term deaths from cancer. When these results were originally disclosed to the press, an NRC official tried to reassure the public by saying that the kind of accident the study considered would be less likely than “a jumbo jet crashing into a football stadium during the Superbowl.”

In the post-9/11 era, the possibility of a jumbo jet crashing into the Superbowl --- or even a nuclear power plant --- no longer seems as remote as it did in 1982. Nonetheless, NRC continues to argue that the 1982 Sandia report is unrealistic because it focused on “worst-case” accidents involving the simultaneous failure of multiple safety systems, which are highly unlikely to occur by chance. But when the potential for terrorist attacks is considered, this argument no longer applies. “Worst-case” scenarios are precisely the ones that terrorists have in mind when planning attacks.

Both NRC and Entergy, the owner of Indian Point, assert that even for the most severe terrorist attack, current emergency plans will be adequate to protect residents who live in the evacuation zone within 10 miles of the plant. They also say that there will be no significant radiological impact on New York City or any other location outside of the 10-mile zone. Accordingly, NRC has opposed proposals made after 9/11 to extend the emergency planning zone around Indian

Point. However, NRC and Entergy have not provided the public with any documentation of the assumptions and calculations underlying these claims.

In view of the lack of public information available on these controversial issues, we carried out an independent technical analysis to help inform the debate. Our calculations were performed with the same state-of-the-art computer code that NRC uses to assess accident consequences. We used the NRC's guidance on the radiological release from a core meltdown, current estimates of radiation risk, population data from the 2000 census, and the most recent evacuation time estimate for the 10-mile Indian Point emergency planning zone. Following the format of the 1982 Sandia report, we calculated the numbers of near-term deaths from acute radiation syndrome, the numbers of long-term deaths from cancer, and the maximum distance at which near-term deaths can occur. We evaluated the impact of both evacuation and sheltering on these outcomes. We also estimated the economic damages due to the long-term relocation of individuals from contaminated areas, and the cost of cleanup or condemnation of those areas.

The health and environmental impacts of a large radiological release at Indian Point depend strongly on the weather conditions. We have carried out calculations for over 140,000 combinations of weather conditions for the New York area and wind directions for the Indian Point site. For this data set, we have determined the average consequences, the peak consequences, and the consequences for "95th percentile" weather conditions (in other words, only 5% of the weather sequences analyzed resulted in greater consequences).

We believe that the 95th percentile results, rather than the average values, represent a reasonable assessment of the likely outcome of a successful terrorist attack, since such attacks would most likely not occur at random, but would be timed to coincide with weather conditions that favor greater casualties. Attacks capable of causing the peak consequences that we calculate would be difficult to achieve because of inaccuracies in weather forecasts, restricted windows of opportunity and other factors, but remain within the realm of possibility.

For a successful attack at one of the two operating Indian Point reactors, we find that

- The number of near-term deaths within 50 miles, due to lethal radiation exposures received within 7 days after the attack, is approximately 3,500 for 95th percentile weather conditions, and approximately 44,000 for the worst case evaluated. Although we assumed that the 10-mile emergency planning zone was entirely evacuated in these cases, this effort was inadequate because (according to Entergy's own estimate) it would take nearly 9.5 hours to fully evacuate the 10-mile zone, whereas in our model the first radiological release occurs about two hours after the attack.
- Near-term deaths can occur among individuals living as far as 18 miles from Indian Point for the 95th percentile case, and as far as 60 miles away in the worst case evaluated. Timely sheltering could be effective in reducing the number of near-term deaths among people residing outside of the 10-mile emergency planning zone, but currently no formal emergency plan is required for these individuals.

- The number of long-term cancer deaths within 50 miles, due to non-acutely lethal radiation exposures within 7 days after the attack, is almost 100,000 for 95th percentile weather conditions and more than 500,000 for the worst weather case evaluated. The peak value corresponds to an attack timed to coincide with weather conditions that maximize radioactive fallout over New York City.
- Based on the 95th percentile case, Food and Drug Administration guidance would recommend that many New York City residents under 40, and children in particular, take potassium iodide (KI) to block absorption for radioactive iodine in the thyroid. However, there is no requirement that KI be stockpiled for use in New York City.
- The economic damages within 100 miles would exceed \$1.1 trillion for the 95th percentile case, and could be as great as \$2.1 trillion for the worst case evaluated, based on Environmental Protection Agency guidance for population relocation and cleanup.

We hope that this information will be useful to Federal, State and local homeland security officials as they continue to develop plans to protect all those at risk from terrorist attacks in the post-9/11 world.